
CAN PLAGUE INC: THE CURE SAVE THE WORLD?

An analysis of serious game Plague Inc: The Cure



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Abstract

In 2020, the World Health Organization (WHO) declared the novel coronavirus COVID-19 outbreak a pandemic. Pandemic response actions were instituted to fight the spread of the virus. Such an awareness raising response was the creation of the serious game *Plague Inc: The Cure*. This game, created in collaboration with health organizations including the WHO, is based on the entertainment game *Plague Inc*. However, adapting a serious message into a game can cause a range of problems, such as *ludopedagogical dissonance*. Against this background, this thesis investigates how the game creates awareness of the pandemic response actions. This is done by establishing and executing a game analysis consisting of text, play experience and context. First, I analyse how the rules of the game create awareness of the actions by focusing on the concept of *procedural rhetoric*. Second, the game is played in the *instrumental* and *explorative play* modes, which demonstrate how *ludopedagogical dissonance* arises in *Plague Inc: The Cure*. Third, the findings of the previous two sections are explored in relation to the context of the game, which consists of the socio-historical context, the production of the game, and the relation to *Plague Inc*. I find that the game elements trigger players to focus on the vaccine and on winning the game through the creation of strategies. This focus results in *ludopedagogical dissonance*, which is the disconnect between the serious intentions of the game, the knowledge allegedly gained through the game and the actual transferred knowledge arises.

Keywords: *Plague Inc: The Cure, ludopedagogical dissonance, serious game, game analysis, procedural rhetoric, instrumental play, explorative play, context*

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1. Introduction

On 11 March 2020 the World Health Organization (WHO) declared the spread of the novel coronavirus COVID-19 a pandemic. Pandemic response actions were formulated and instituted by governments and organisations such as the WHO. The institution of pandemic response actions aims to quell a pandemic in the most appropriate way possible. In this case, the widely used measures are mask usage, lockdowns and vaccinations.¹ However, the willingness of the public to subscribe to such measures is staggered. To successfully eradicate the threat, it is crucial that the public as a whole complies with the recommended response actions. To inform citizens of the importance of these preventive actions, different strategies can be applied. One such potential strategy is the creation of a serious game. In the thick of the COVID-19 pandemic, the creators of a pandemic simulation game saw the opportunity to incorporate the pandemic response actions prescribed by the WHO into their game.²

The game that was created with the help of the WHO and the Coalition for Epidemic Preparedness Innovations (CEPI) is *Plague Inc: The Cure*. It is based on the popular entertainment game *Plague Inc*, which was released in 2012 by the game studio Ndemic Creations. For players the goal of *Plague Inc* is to wipe out the global population by creating a virus and applying its symptoms and abilities.³ When the COVID-19 pandemic emerged, Ndemic Creations decided to enlist the help of health organisations and revise the goal of the game. *Plague Inc: The Cure* was released on 11 November 2020, at the height of the pandemic. Instead of destroying mankind, players could now save the global population from a pandemic. The purpose of this game is to “raise awareness of the tools and challenges that must be overcome to respond to outbreaks.”⁴ According to CEPI, the game is “an incredibly important medium for education and public awareness.”⁵

The aim of this thesis is to examine whether the designers of the serious game achieved the purpose of educating the public and raising awareness. The adaptation of an entertainment game to become a serious game can give rise to a number of problems. First, games often fail to convey one single message, resulting in a range of messages and potential

¹ World Health Organization, “Critical Preparedness, Readiness and Response Actions for COVID-19,” Interim Guidance (November 2020): 1-12.

² J. Smith, N. Sears, B. Taylor and M. Johnson, “Serious Games for Serious Crises: Reflections from an Infectious Disease Outbreak Matrix Game,” *Globalization and Health* 16 (2020): 7, <https://doi.org/10.1186/s12992-020-00547-6>; “Plague Inc: The Cure is Out Now for IOS and Android,” News, Ndemic Creations, last modified November 11, 2020, <https://www.ndemiccreations.com/en/news/184-plague-inc-the-cure-is-out-now-for-ios-and-android>.

³ Ndemic Creations, *Plague Inc*. (2012), [App for Android], Ndemic Creations and Miniclip.

⁴ Ndemic Creations, “Plague Inc: The Cure is Out Now for IOS and Android.”

⁵ “Plague Inc. The Cure.” CEPI, accessed April 29, 2021, <https://cepi.net/plagueinc/>.

interpretations. Second, a serious game based on an entertainment game may place the fun play experience at the forefront of players' attention, rather than the game's serious message.⁶ To analyse the degree to which the game *Plague Inc: The Cure* contributes to the creation of awareness of the pandemic response actions, the following research question will be answered in this thesis: "How does *Plague Inc: The Cure* create awareness of pandemic response actions?"

To answer the main research question, three sub-questions regarding text, play experience and context need to be answered first. Exploring these three aspects contribute to meaningful game analysis, which is the method that will be used in this thesis. According to Clara Fernández-Vara, a common mistake that researchers make when performing game analysis is overlooking aspects outside of the game. The play experience and the circumstances around the game also need to be taken into account.⁷

The first sub-question focuses on the ways in which *Plague Inc: The Cure* tries to persuade its players of what is required to stop a pandemic. I will consider what game elements are of a persuasive nature by examining them through the lens of Ian Bogost's concept of procedural rhetoric. Underlying the predefined rules of a game is a fundamental argument that the creator intends the players to accept.⁸ Therefore, the first sub-question is: "How do the rules in *Plague Inc: The Cure* create awareness of pandemic response actions?"

The second important aspect of game analysis is also the theme of the second sub-question, namely the play experience. A criticism that can be directed at procedural rhetoric is that the play experience needs to be taken into account, because players can interpret the game differently from how the authors intended it to be played.⁹ The second part of the analysis is therefore a further exploration of procedural rhetoric and the criticisms that has been levelled against it. I demonstrate two different play experiences by playing the game in the instrumental and explorative mode as described by Jasper van Vught and René Glas. Instrumental play demonstrates how the game encourages the player to gain awareness of the

⁶ J. Sharp, "I Love Pandemic (and I Despair for Serious Games)," in *Tabletop: An Analog Game Design*, ed, D. Davidson and G. Costikyan, (ETC Press, 2011), 127-128.

⁷ C. Fernández-Vara, *Introduction to Game Analysis* (New York: Routledge, 2015), 14.

⁸ I. Bogost, "Procedural Rhetoric," in *Persuasive Games: The Expressive Power of Videogames* (Cambridge: The MIT Press, 2007), 3.

⁹ T. de la Hera Conde-Pumpido and J. Raessens, "Looking Beyond Persuasion Through Rule-Based Representations in Digital Games: Designing Games to Shape, Reinforce, or Change Attitudes," in *Persuasive Gaming in Context*, ed. T. de la Hera, J. Jansz, J. Raessens and B. Schouten (Amsterdam: Amsterdam University Press, 2021), 60-61.; M. Sicart, "Against Procedurality," *Game Studies* 11, no. 3 (December 2011): 6.

pandemic response actions. Explorative play is about the creativity of the player.¹⁰ My thesis expands on the work of Van Vught and Glas by including the concept of ludopedagogical dissonance as described by John Sharp. Sharp defines ludopedagogical dissonance as the disconnect between the seriousness of the theme and intentions of a game, the play experience, and the knowledge that is assumed to be transferred.¹¹ By playing the game in different modes, I can compare and analyse how the game invites players to gain awareness of pandemic response actions. Therefore, the second sub-question is: “How does the game invite the player to gain awareness of the pandemic response actions played in instrumental and in explorative game mode?”

The third sub-question, which deals with the game and the context of the game, asks: “How do the game and its play experience relate to the context?” This final sub-question combines the previous two questions and places them in relation to the context of the game. This context includes the socio-historical context of the pandemic, who the producers of the game are and how the game relates to its predecessor, *Plague Inc.*

Chapter 2 present and discusses this study’s theoretical framework, consisting of theories on communication and how these were applied during the COVID-19 pandemic (2.1.) and theories on serious games and their elation to entertainment games (2.2.). Chapter 3 presents an extensive explanation of how the game analysis is executed. In Chapter 4, the analysis is performed on the basis of the three sub-questions. Lastly, in Chapter 5, a conclusion is drawn and the research question is answered. In addition, the limitations of this study are discussed.

¹⁰ J. Van Vught and R. Glas, “Considering Play: From Method to Analysis,” *Transactions of the Digital Games Research Association Journal* 4, no. 1 (2018): 205-242.

¹¹ Sharp, “I Love Pandemic,” 127-128.

2. Theoretical framework

In this chapter, the theories and articles relevant to this are discussed. The first section (2.1.) focuses on communication during COVID-19 and how such communications relate to my thesis. The second section (2.2.) focuses on the ways in which *Plague Inc: The Cure* relates to both serious games and entertainment games.

2.1. Communication during COVID-19

COVID-19 not only changed the way we live but also resulted in an upsurge of research papers exploring the elements required to successfully communicate with the public. While such texts all focus on the best possible communication of the pandemic response actions, they also share three additional similarities. Most of these papers examine how the context of the pandemic changed the communication, how the content of the communication needed to be shaped, and who the intended audience of the content is. My analysis *Plague Inc: The Cure* similarly focuses on these three aspects.

I will first discuss the relevant texts in the context of the pandemic. From the start of the outbreak, the WHO informed the public and governments of the importance of pandemic response actions. The organisation has done so not only by releasing guides on response actions but also by offering a helping hand in communicating the importance of these actions.¹² In addition, the WHO has to deal with what can be described as a second ‘disease’, namely the infodemic around COVID-19. The term ‘infodemic’ refers to the sudden spread of an abundance of information, factual and non-factual, on, for example, a disease. This abundance of information can complicate the communication of accurate information and cause people to refuse to heed the messaging coming from the governments and health organisations.¹³ This refusal and lack of cooperation is not only due to the infodemic, but also because of the intangibility of COVID-19. Because a virus is an invisible enemy, the public might not take pandemic response actions at face value.¹⁴ Consequently, providing context is more crucial now than ever when communicating COVID-19 related messages.

The second aspect shared by the texts is the content of their communication. The content has to be accurate and communicate seriousness and urgency, while remaining

¹² World Health Organization, “Critical Preparedness,” 1-12.

¹³ T. Porat, R. Nyrup, R. A. Calvo, P. Paudyal and E. Ford, “Public Health and Risk Communication During COVID-19 – Enhancing Psychological Needs to Promote Sustainable Behavior Change,” *Frontiers in Public Health* 8 (October 2020): 2.

¹⁴ M. Henriques, “Social Distancing: How to Persuade Others it Works,” *Future, COVID-19*, BBC, last modified April 6, 2020, <https://www.bbc.com/future/article/20200402-covid-19-how-to-convince-others-social-distancing-works>.

interesting. As mentioned, one of the challenges facing communication around COVID-19 is the invisibility of the virus. Leslie Martin has suggested including visual imagery, such as dots, to help people understand the seriousness of COVID-19.¹⁵ By employing dots, the transmission of the virus can be explained better and the messaging around social distancing can be given greater impact. Pandemic response actions gain merit when medical institutions and specialists are mentioned in the content. When the public is convinced that the messenger is an expert, they will be more willing to follow the rules.¹⁶ While the WHO, CEPI and other institutions have worked on *The Cure*, my analysis will indicate that this fact was not clearly communicated to players. Consequently, the game's message will not be taken as seriously as intended. Another way in which the public can be convinced of the need for pandemic response actions is by making the message positive.¹⁷ This is another strategy that the creators of *The Cure* could have implemented. While communication has to be clear and understandable, it is also beneficial to communicate creatively. An example of such creativity is using the social-media platform TikTok to get the message across.¹⁸ TikTok is a popular platform with around 500 million users. Most subscribers are pre- and late adolescents. TikTok merges the fun experience of creating and watching videos with serious messages about COVID-19.¹⁹ As stated, the COVID-19 infodemic poses a major challenge to retaining the attention of specific groups of people. If messages are continually communicated in the same way, some people may become oversaturated.²⁰ This is what makes *Plague Inc: The Cure* such a compelling case. The game has a following of around a 100 million players and it represents an entertaining means of communicating serious information. However, as demonstrated in section 4.2.2., ludopedagogical dissonance arises. In other words, a disconnect exists between the seriousness of the game, the play experience, and the knowledge that is assumed to be transferred to the player.²¹

The third aspect is the target audience – in this case, the public. When communicating about COVID-19, the focus does not lie solely on the context, but also on who the audience of the message is. As seen above, content can be catered for young people by using a platform

¹⁵ Henriques, "Social Distancing."

¹⁶ Henriques, "Social Distancing."

¹⁷ Henriques, "Social Distancing."

¹⁸ L. Wallace, "The 3 Pillars of Effective Communication during COVID-19," *isentia*, last modified May 14, 2020, <https://www.isentia.com/latest-reads/the-3-pillars-of-effective-communication-during-covid-19/>.

¹⁹ C. B. Bucknell and R. Kottasz, "Uses and Gratifications Sought by Pre-adolescent and Adolescent TikTok Consumers," *Young Consumers* 21, no. 4 (2020): 2.

²⁰ J. Sutton et al., "Longitudinal Risk Communication: A Research Agenda for Communicating in a Pandemic," *Health Security* 19, no. 4 (2020): 3.

²¹ Sharp, "I Love Pandemic," 127-128.r

such as TikTok. However, the content has to be targeted at the intended audience in the right way. A common mistake in communication strategies is that messages are sent to the wrong targets. This can be caused by a misalignment between the intended target and the target that will in fact undergo the biggest attitude change. By focusing on targets who are already leaning in a positive direction, stronger support can eventually be created.²² This statement is also of interest to the efficacy of *The Cure* as a medium of communication, mostly because it has a specific target audience, namely people who play games. In section 4.3.3. I describe how the game's target audience is problematic in relation to the creator's intended purpose.

To conclude, the three aspects of context, content and receiver are closely related, and an interplay exists between them. One cannot exist without the other. This reaffirms Fernández-Vara's statement that a game's context and play experience should be taken into account.²³ Even though the mentioned texts do not deal with games, they do deal with communication during COVID-19. *Plague Inc: The Cure* is part of the communication done by big organisations during the pandemic. The nature of an infodemic causes complications in communicating effectively to an intended audience, while discerning truth from fiction becomes a problem as boredom and satiation creep in.²⁴ Communicating the importance of pandemic response actions in a game could be an effective solution to all the problems mentioned above. A game could prevent boredom, because the medium of communication is an entertaining experience. However, using a game can still present the same pitfalls as more frequently used methods of communication.

2.2. Serious games and entertainment games

Before taking a closer look at *Plague Inc: The Cure*, I will first describe its relationship to serious games and entertainment games. *Plague Inc: The Cure* can be defined as a serious game, mostly because of the intentions of its creators. According to Clark C. Abt, a serious game has a thought-out and explicit educational purpose. The game is not intended to be played primarily for amusement.²⁵ In the case of *The Cure*, the creators made the game with the serious intention to create awareness of pandemic response actions. Joost Raessens describes five elements that play a crucial role in the definition of a serious game: "1. The intention or purpose with which these games are designed; 2. The intention or purpose with

²² C. J. Bechler and Z. L. Tormala, "Misdirecting Persuasive Efforts during the COVID-19 Pandemic: The Targets People Choose May Not Be the Most Likely to Change," *JARC* 6, no. 1 (2020): 188-194.

²³ Fernández-Vara, *Introduction*, 33.

²⁴ Sutton et al., "Longitudinal Risk Communication," 3-4.

²⁵ C. C. Abt, "The Reunion of Action and Thought," in *Serious Games* (New York: Viking Press, 1970), 3-14.

which they are used in a specific context; 3. The issues addressed by these games; 4. Their possible real-life effects on the outside world; and 5. Their impact on the player.”²⁶ *Plague Inc: The Cure* can be defined as a serious game because it is designed with the purpose of raising awareness. As said by CEPI it is an “incredibly important medium for education and public awareness” (element 1 and element 2). It addresses issues such as pandemic control and vaccination (element 3). It was created specifically during the COVID-19 crisis to help people understand and come to terms with what is happening (element 4 and element 5).²⁷ Through the five elements as defined by Raessens, I am able to define *Plague Inc: The Cure* as a serious game and thus analyse it as such.

The supposed counterpart of serious games are entertainment games. These games can be defined as games designed with the sole purpose of entertainment.²⁸ While the distinction between serious games and entertainment games seems clear from these two definitions, the distinction does not always hold true. Although entertainment games are designed to provide an entertaining game experience, they can also be used for serious purposes. An example is the *Assassin’s Creed* series: Historical facts embedded in the game can be used in classrooms. They comply to the elements 2, 4 and 5 as defined by Raessens, as they are used in a learning environment, have real-life effects and have impact on the player. This is one example of commercial games that, along with others, lend themselves to learning and serves to indicate that the distinction between serious and entertainment games is not clear cut.²⁹ It is therefore not surprising that the creators of *Plague Inc: The Cure* based their serious game on an entertainment game. Serious games can benefit greatly from entertainment game design. For example, the developers of serious games can learn to develop an interesting and entertaining game environment to ensure that they capture and retain the attention of their players. *Plague Inc: The Cure* answers the call for joint game development by the entertainment game industry and the serious games community.³⁰

²⁶ J. Raessens, “Playful Identity Politics: How Refugee Games affect the Player’s Identity,” in *The Ludification of Digital Media Cultures*, ed. V. Frissen, S. Lammes, M. de Lange, J. de Mul and J. Raessens (Amsterdam University Press, 2015), 246.

²⁷ Ndemec Creations, “Plague Inc: The Cure is Out Now.”

²⁸ M. Asgari and D. Kaufman, “Motivation, Learning, and Game Design,” in *Handbook of Research on Effective Electronic Gaming in Education*, ed. Richard E. Ferdig (New York: Hershey, 2009): 1166.

²⁹ T. Karsenti and S. Parent, “Teaching History with the Video Game Assassin’s Creed: Effective Teaching Practices and Reported Learning,” *Review of Science, Mathematics and ICT Education* 14, no. 1 (2020): 29.; E. C. Anania, J. R. Keebler, K. M. Anglin and J. P. Kring, “Using the Cooperative Board Game *Pandemic* to Study Teamwork,” *Proceedings of the Human Factors and Ergonomics Society 2016 Annual Meeting* (2016): 1770-1774.

³⁰ A. Azadegan, et al, “The Move Beyond Edutainment: Have We Learnt Our Lessons from Entertainment Games?” *Games and Learning Alliance. GALA 2013. Lecture Notes in Computer Science* 8605 (May 2012): 77-89.

Plague Inc: The Cure is based on *Plague Inc*, the entertainment game released in 2012. *Plague Inc* is a strategy game that was created with the intention of being an enjoyable entertainment game. *Plague Inc*. supports problem-based learning, despite it not being the intention of the creators to support this.³¹ Basing *The Cure* on its entertainment predecessor has its advantages, the most obvious one being that it is an entertaining game to play. The creators of the game copied the goal oriented gameplay of *Plague Inc*. to maintain the entertaining game experience. However, this replication of the gameplay is also disadvantageous, given that ludopedagogical dissonance arises.

The term ludopedagogical dissonance was coined by Sharp, who explained that this dissonance stems from a disconnect between the seriousness, the play experience, and the knowledge that is assumed to be transferred. For example, ludopedagogical dissonance occurs when a game intended to teach players about environmentalism results in the only player improving their hand-eye coordination or having an enjoyable play experience, with no environmental knowledge gained. Ludopedagogical dissonance often arises because games are not good at explaining a single position.³² In section 4.2. and 4.3. of the analysis, I describe how the play experience of *Plague Inc: The Cure* does result in ludopedagogical dissonance. My findings show that basing a serious game on an entertainment game not dissolve the problem of ludopedagogical dissonance; in fact, it is increased.

The call for more research on serious games and their ability to promote the successful management of real-life problems is an understandable one.³³ By including the concept of ludopedagogical dissonance, I add a new dimension to the literature on serious games. This disconnect between play and seriousness hampers the potential of serious games to achieve their intended purpose.³⁴ In my analysis, I will explain why *Plague Inc: The Cure* is an example of the ways in which ludopedagogical dissonance can arise.

³¹ L. Jacques, "An Analysis of Plague, Inc.: Evolved for Learning," in *Well Played, a Journal on Video Games, Value and Meaning*, ed. D. Davidson (Halifax: ETC Press, 2015), 121.

³² Sharp, "I Love Pandemic," 127.

³³ C. Fabriatore, D. Gyaurov and X. Lopez, "Rethinking Serious Games Design in the Age of COVID-19: Setting the Focus on Wicked Problems," *Serious Games. JCSG 2020. Lecture Notes in Computer Science* 12434 (2020), ed. Ma, M., B. Fletcher, S. Göbel, J. Baalsrud Hauge and T. Marsh: 257, https://doi.org/10.1007/978-3-030-61814-8_19.

³⁴ K. Emmerich and M. Bockholt, "Serious Games Evaluation Evaluation: Processes, Models, and Concepts," in *Entertainment Computing and Serious Games*, ed. R. Dörner et al. (Springer International Publishing, 2016), 266.

3. Game analysis

In this chapter I will explain the method I use to analyse *Plague Inc: The Cure*. To provide a comprehensive analysis of the game, one that goes beyond just text, I divided my research into three sub-questions that address text, play, and context. A comprehensive game analysis includes the text, the play experience, and the context of the game.³⁵

I analyse the text of *Plague Inc: The Cure* by employing the concept of procedural rhetoric (3.1.). The play experience will be divided into instrumental play and explorative play, as defined by Van Vught and Glas (3.2.). The third aspect of my game analysis is context, which consists of three parts: socio-historical context, production and relation to *Plague Inc*. (3.3.).

3.1. Text: procedural rhetoric

The first sub-question of this thesis focuses on persuasive game elements, by asking “How do the rules in *Plague Inc: The Cure* create awareness of pandemic response actions?”

To answer this question, the concept of procedural rhetoric is used to assess how the rules try to convince the players of certain arguments. The term procedural rhetoric was coined by Ian Bogost to describe how games can make claims about how the world works. These claims are made through the game’s codes and procedures. These codes and procedures hold an argument made by the creators of the game.³⁶ The arguments made by creators are embedded in the rules of the game. According to proceduralists, players assume the arguments that are embedded in the rules.³⁷ In the case of *Plague Inc: The Cure*, the goal is to make players aware of the importance of pandemic response actions. The game therefore requires rules containing an argument, which the player adopts when playing the game.

To complement Bogost’s definition, I employ Clara Fernández-Vara’s description of the five building blocks of game analysis, to support my analysis of the ways in which procedural rhetoric occurs in a game. These building blocks are: What does the game punish; What does the game reward?; What inclusions or omissions in the game reflect an ideological stance?; What elements of the game express ethical values?; Is the ideology of the game integrated in the rules or in cut-scenes?³⁸ In my analysis, I use only the first three building blocks. The reasons for my choice are as follows: First, my sub-question does not focus on the

³⁵ Fernández-Vara, *Introduction*, 32-33.

³⁶ Bogost, “Procedural Rhetoric,” 3.

³⁷ Sicart, “Against Procedurality,” 5-6.

³⁸ Fernández-Vara, *Introduction*, 132-133.

ethical values that the game reflects. Second, *Plague Inc: The Cure* is a strategy based game that does not contain storytelling and cut-scenes.

3.2. Play: play as method and ludopedagogical dissonance

While Miguel Sicart also implements procedural rhetoric, he critiques the concept. He argues that procedural rhetoric suggests that players, guided by the rules, actively understand the meaning. Sicart states that the behaviours of players cannot be predicted and that they are more than mere activators of the meanings imbedded in the game. Sicart calls for a procedural analysis which takes play into account and complements the procedural rhetoric.³⁹

While Sicart calls for play to be taken into account, he only briefly mentions how procedural rhetoric calls for instrumental play.⁴⁰ Fernández-Vara supplements this research with her building blocks for procedural rhetoric, though she only mentions the importance of taking play into account when the game is subjected to game analysis. In my view, the experience of the player is important in understanding the game, which is why I supplement Fernández-Varas building blocks with instrumental play and explorative play as defined by Van Vught and Glas. By playing a game in different play modes, different elements of a game can be highlighted. Of the various play modes defined by Van Vught and Glas, I will use instrumental play and explorative play in my analysis.⁴¹ Thus the second sub-question is: “How does the game invite the player to gain awareness of the pandemic response actions when the game is played in instrumental and in explorative game mode?”

I will first consider instrumental play. Bogost presumes that there is an ideal player who does exactly what the creator intended them to do. As noted by Sicart, by playing the game in instrumental mode, I closely resemble this ideal player, because instrumental play is a goal-oriented form of play in which the player does what the game asks of them.⁴² The game’s formal elements encourage players to act in certain ways.⁴³ The game elements that encourage players to gain awareness will be found in the first part of the analysis, as described in section 3.1. By playing the game instrumentally, I will be able to ascertain what lessons players take from the game when they play it in the intended way.

The explorative mode of play aligns with Sicart’s critique of Bogost’s procedural rhetoric. Sicart rejects the disregard for the creativity of players, stating that it is not inevitable

³⁹ Sicart, “Against Procedurality,” 7-19.

⁴⁰ Sicart, “Against Procedurality,” 11.

⁴¹ Van Vught and Glas, “Considering Play,” 207.

⁴² Sicart, “Against Procedurality,” 11.

⁴³ Van Vught and Glas, “Considering Play,” 214-215.

that players will follow the gameplay intended by the creators.⁴⁴ A player's creativity can see them wandering off the paths that the game outlines for them, for instance by ignoring obvious cues from the game. The play mode that best takes into account the creativity of players in *Plague Inc: The Cure* is explorative play.⁴⁵ This game mode allows my game analysis to provide a better insight into the ways in which the game steers its players.

While playing *Plague Inc: The Cure* in two modes of play, I will focus on any possible ludopedagogical dissonance that may arise. This disconnect between the purpose of the game, the play experience and the knowledge the player gains can arise when a serious game is being played.⁴⁶ In the case of *The Cure*, ludopedagogical dissonance arises because this game incorporates aspects of its predecessor. This part of my game analysis focuses on how ludopedagogical dissonance is present in the game.

3.3. Context: the pandemic

The third and final part of the analysis focuses on the context of *Plague Inc: The Cure*. The sub-question is: "How do the game and its play experience relate to the context?" According to Fernández-Vara, context helps us to better understand the game. For one, the context can provide greater clarity on the purpose of a game.⁴⁷ The intention of *Plague Inc: The Cure* is to create awareness of pandemic response actions, and the overall research question of this thesis is whether the game succeeds in creating such awareness.

Of the eight building blocks identified by Fernández-Vara on analysing context, I have selected three to help answer the sub-question: socio-historical context, production and relation to the predecessor.⁴⁸ Most important is the socio-historical context, which is the pandemic. The game was created because of the pandemic and would not exist without it. The production process is of interest mostly because the game was created by game designers in collaboration with health organisations such as CEPI and the WHO. Lastly, the relation of the game to its predecessor is taken into account, because the game is based on pre-existing work. The building blocks that will not be included are: context inside the game, game genre, technological context, economic context and audience.

⁴⁴ De la Hera, "A Critical Analysis," 72-73.

⁴⁵ Van Vught and Glas, "Considering Play," 221.

⁴⁶ Sharp, "I Love Pandemic," 127-128.

⁴⁷ Fernández-Vara, *Introduction*, 57.

⁴⁸ Fernández-Vara, *Introduction*, 59-60.

4. Analysis

In this chapter I analyse how the game elements of *Plague Inc: The Cure* create awareness of pandemic response actions. This chapter is divided into three parts, in which I focus on the game at three levels. First, I will look at the rules of the game that create awareness of pandemic response actions (4.1.). Second, the game is played in instrumental and explorative mode, to examine the ways in which the game invites players in different play modes to gain awareness of the pandemic response actions (4.2). Third and finally, I will focus on how the game relates to its context (4.3).

Throughout this analysis, I will use screenshots taken during multiple sessions of playing the game. Of the two versions of the game, mobile version and computer version, I have played the mobile version. Furthermore, I played the game in normal mode, which is the second of three levels of difficulty.

4.1. Text: Persuasive game elements

In this first section of the analysis I focus on how the rules of *Plague Inc: The Cure* create awareness of pandemic response actions. I have divided this part of the analysis into the three arguments found in the rules of the game: dealing with a pandemic requires a lot of work and planning, the vaccine is the most important pandemic response action, and maintaining authority is an important part of saving lives. Throughout my consideration of these three arguments, I will use three of the building blocks defined by Fernández-Vara: focusing on how the game punishes certain actions, focusing on how the game rewards certain actions, and examining which inclusions in and omissions from the game reflect a particular ideology.⁴⁹ Table 1 presents a scheme that summarises the findings.

⁴⁹ Fernández-Vara, *Introduction*, 132.

	Dealing with a pandemic takes a lot of work	The vaccine is the most important pandemic response action	Maintaining authority is an important part of saving lives
Punishment(s)	Riots due to poorly timed pandemic response actions. Authority level drops due to poorly timed pandemic response actions.	It is impossible to win the game without the vaccine.	The player cannot win the game when the focus is not on both authority and pandemic response actions.
Reward(s)	Spread of disease slows down due to correct implementation of response actions. Authority levels remain high due to good implementation of pandemic response actions.	Player wins the game once the vaccine is deployed. Vaccine is released in a matter of days. Blue vaccine bubbles are worth points.	The authority level stays high when the right pandemic response actions are applied at the right time.
Inclusion(s)	Multiplicity of pandemic response actions. Censorship. Spread of virus.	Blue vaccine bubbles, which are worth points.	The authority level bar.
Omission(s)	Inability of the player to change the genetic code.	Absence of struggles that come along with creating and releasing the vaccine.	Inability of the player to transfer the responsibility of saving the world to someone else when their authority is still on par.

Table 1: Scheme of findings 4.1

4.1.1. Dealing with a pandemic requires a great deal of work and planning

The first way in which the rules of the game create awareness of pandemic response actions is through showing how difficult it is to deal with a pandemic. The goal for the player is to rid the world of a pandemic. There are four tabs in which most of these actions can be found: disease, transmission, symptoms and abilities (displayed at the top of Figure 1). In these tabs, players can find such actions as using hand-washing equipment. The pandemic response actions can be used when the player has gained enough DNA points. The player also has to make sure that their Authority level, which can be seen as their lives bar, remains above 0.

The rules of the game contain the argument that it is difficult to tackle a pandemic and that much work and planning is required to do so. This can be deduced from the fact that the

game punishes certain actions when they are not used at the right time. For instance, when people are placed under lockdown when the infection and death rates are low, the player gets a negative response. Consequently, riots can occur and the level of authority the player fights to maintain will degrade in point value. By punishing actions such as these, the game demonstrates how the player is not only fighting a disease but also dealing with the people who are in danger of contracting the disease.

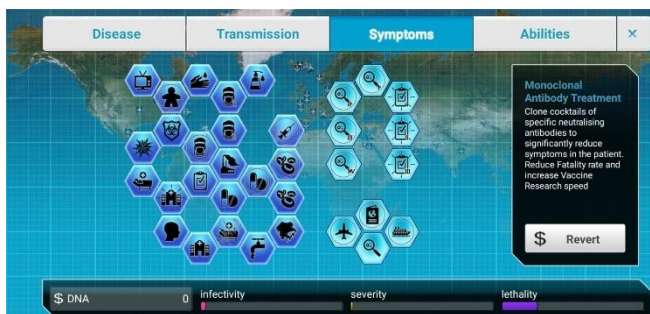


Figure 1

Top of screen: Tabs from the pandemic response actions

Middle: All pandemic response actions from the symptoms tab

Bottom: DNA points and information on the disease

The game also works the other way around. When the player uses the right response actions at the right time, they will be rewarded. For instance, when the player notices that the disease is spreading to multiple countries and responds by using self-isolation and border monitoring, the spread of the disease usually slows down. Using pandemic response actions helps to keep up the authority, which can be seen as the player's level or lives bar. Closely observing what the world needs at what moment results in the player maintaining their authority and allows them to continue the game.

The third building block as defined by Fernández-Vara addresses which inclusions and omissions in the game reflect an ideological stance. Inclusions that reflect the ideological stance the pandemic is a tough situation to fix are the multiplicity of pandemic response actions, censorship and the spread of the virus. A wide range of response options are available to the player, such as hand-washing, border monitoring, lockdown and censorship. The player has to choose the right pandemic response action from all the options to save the world. This is no easy feat. As mentioned, censorship is also a pandemic response action. By including this option, the game indicates the kinds of decisions that health organisations and governments are faced with when dealing with a pandemic and a related infodemic. Implementing censorship is a difficult decision mostly because freedom of speech and the press is the norm in many countries around the world. Still, such difficult decisions have to be made. With regards to the punishments included in the game, the actions need to be used at the right time.

Lastly, the omission that reflects an ideological stance is the inability of the player to change the genetic code of the disease. Information on the disease can be found next to the pandemic response actions tabs. However, players are not able to do anything with this part of the game. Information is given on how the disease works, its origin and its symptoms. The graphs can help the player to fight the disease, but no more. The player cannot change anything about the disease itself. This reflects how health organisations and governments are unable to stop the disease by changing the virus's genetic code. The virus can only be stopped by the implementation of pandemic response actions. There is no easy solution to the problem, both in the game and in real life.

4.1.2. The vaccine is the most important pandemic response action

While the rules of the game create awareness by showing how difficult it is to deal with a pandemic, they also do so by steering the player towards the seemingly most important pandemic response action, the vaccine. The game punishes players for doing vaccine research. This punishment is most obvious in the fact that the player cannot win the game if they fail to implement vaccine research and manufacturing. In addition, the vaccine has to be distributed throughout the whole world for the player to win.

The game rewards players when they embark on vaccine research. Once research has started, blue bubbles begin to pop-up in the game. These bubbles indicate that the vaccine research and manufacturing is going well. When the player pops these bubbles, they are given more DNA points, which can be used for implementing more pandemic response actions. The vaccine is the only pandemic response action to cause these blue bubbles and unleash the extra DNA points. In addition, the vaccine is released in a matter of days and the result is that the world is saved from the pandemic. Thus, the game rewards the player for starting the vaccine research by awarding them more DNA points and ultimately allowing them to win the game.

The positioning in the game of the vaccine as the most important pandemic response action is supported by the fact that the blue vaccine bubbles give the player more DNA points. When a vaccine is created, the player is given more room to manoeuvre and the chance to implement more pandemic response actions.

Despite the success of the above-mentioned inclusions, certain omissions from the game are notable. The most striking omission is the fact that many challenges that come with creating and releasing a vaccine were excluded from the game. Multiple issues in real life, such as anti-vaxxers, have the potential to hamper the positive effects of a vaccine. For

instance anti-vaxxers blocking distribution centres could have been included in the game. However, in the game, the vaccine can be slowed down only slightly when manufacturing is delayed. This problem can easily be solved with minimal amounts of DNA points, allowing the speedy release of the vaccine. In my view, the omission of real-life challenges to the successful and speedy production and dissemination of a vaccine is a serious shortcoming of the game.

4.1.3. Maintaining authority is an important part of saving lives

The final way in which the rules of the game create awareness of the pandemic response actions is by attempting to convince the player that saving the world and maintaining credibility as a health organisation are interrelated. After all, in real life, actual health organisations need to maintain their credibility for people to trust that they will deliver on their mandate. While the goal of the game is to save the world from a pandemic, the player can only achieve that if their authority levels remain high enough. As illustrated in Figure 2, from the outset the game emphasises the interaction between having authority and saving the world. The player needs to protect humanity and simultaneously lead the global response.



Figure 2: The message that starts the game

The game punishes the player when they fail to focus on maintaining their authority. The player's authority can be regarded as their level of credibility. This is indicated by the fact that pop-ups remind the player that their authority is dwindling when citizens disagree with actions they have taken. It is therefore of the utmost importance in the game for the player to keep their authority level high. Low levels of authority will not allow the player to achieve the goal and will ultimately result in ending the game.

The game does allow the player to save the world and maintain their authority if they implement the right pandemic response actions at the right time. As discussed in 4.1.1., saving

the world from a pandemic is hard work. When the player implements the right response actions, they will be rewarded by not losing authority points. This allows them to continue playing and eventually win the game.

The inclusion of the authority level serves to indicate how credibility and saving the world are intertwined. In *Plague Inc*, no authority level was included. By making this inclusion, the creators show how important credibility is if the player were to save the world. Players are obligated to keep track of what the people think of their pandemic response actions, along with other consequences, regardless of what the player views as the right thing to do.

Lastly, an omission from the game that demonstrates the important relationship between authority and the goal of the game is the fact that the player is unable to leave the responsibility of saving the world to someone else when their authority levels are still on par. The player can only quit by winning, losing or leaving the game. Therefore, the player is obligated to save the world for as long as their authority level remains high enough.

4.2. Play: instrumental and explorative play

For this part of the analysis, I first played the game in instrumental play mode and then in explorative play mode. Instrumental play mode should affirm the procedural rhetoric of the game, because instrumental play is about playing the game as it should be played. However, it is possible for players to interpret the game differently from the way in which the authors intended it to be played.⁵⁰ Explorative play mode allows for the latter scenario. In explorative play mode, the player plays creatively and explores the game by not following the game's instructions or prompts. This mode can result in a different interpretation of the game, which might lead to ludopedagogical dissonance. Ludopedagogical dissonance is present when the serious message of the game is not transferred to the player when the game is played.⁵¹

In section 4.1., I found that the game aims to convey three arguments: dealing with a pandemic is difficult; the vaccine is an important pandemic response action; and authority equals saving lives. These findings informed my decision to base this current section of the analysis on three similar themes: the difficulty of dealing with the pandemic, the vaccine and authority.

50 M. Sicart, "Against Procedurality," *Game Studies* 11, no. 3 (December 2011): 6.

51 Sharp, "I Love Pandemic," 127-128.

4.2.1. Instrumental play

I first played the game instrumentally. This means that I did what the game expected of me. In this section I will describe how the game indicated what it expected of me and how this play experience resulted in a small degree of ludopedagogical dissonance.

The difficulty of dealing with a pandemic: being steered by the game

The game steers the player towards certain actions in both implicit and explicit ways. It is clear from the outset that the player has to save the world from a plague: An explicit pop-up message describes this (Figure 2). This message is clearly directed at the player, who is playing as a fictional health organisation. It is therefore clear from the start what the game expects of the player. Soon, another pop-up informs the player that outbreaks need to be investigated. Not only does the pop-up alert the player to this requirement, but ‘investigate outbreaks’ is the only action that can be taken at this point. Once the disease has been detected, the game allows the player to take more actions. By explicitly indicating that the detection of the disease is the first action that is required, the game demonstrates to the player what it takes to start saving the world from a pandemic: It is necessary to accurately identify the disease before anything else can be done.



Figure 3

Top middle of screen: The red pop-up bubble shows the player that the disease has spread to this country

Bottom left of screen: Authority level and DNA points

Bottom right of screen: Vaccine research progress

The game does not always steer the player in this obvious manner. An example of more implicit guidance are the pop-ups that indicate the spread of the disease. The red bubbles pop up once a country has become infected (Figure 3). These bubbles, along with red dots appearing in airplanes and ships carrying infected people, indicate that the virus is spreading. When the player sees all of these red markers on the map, they are steered towards taking action. According to psychologist Leslie Martin, the use of using visual imagery, such as dots, is helpful in motivating people to follow social distancing and isolation rules.⁵² The same applies to the player, because the red dots steer the player towards using the self-

⁵² Henriques, “Social Distancing.”

isolation option and the monitoring of borders option. When the player chooses these options, the result is that the infection rate starts slowing down. The game steers the player towards using these pandemic response actions and consequently teaches the player about what it takes to stop a virus from spreading.

While the game does do some steering, it also allows the player a degree of freedom in their course of action. The game does not take the player by the hand. The player has to figure out how to stop the pandemic themselves. This reaffirms the procedural rhetoric described in 4.1.1., namely that winning the game presents a serious challenge. The player has to think deeply about how to get rid of the pandemic. This reflects the underlying argument that dealing with a pandemic is demanding and requires a great deal of work and effort.

Vaccination: The vaccine is important

In section 4.1. of the analysis, I found that the rules force players to implement vaccination. While the rules of the game suggest that the vaccine is a silver bullet, the game also demonstrates how vaccine manufacturing is not as straightforward as it looks. At one point in the game, the manufacturing of the vaccine is halted. When the player invests in vaccine production, the manufacturing returns to normal speed. While this does show that the player should not entirely rely on the vaccine but implement other pandemic response actions as well, the main focus of the game remains on the vaccine.

While playing the game, I noticed the extent to which the player was being directed towards the development of a vaccine, not only by the rules of the game, but also by other game elements. From early on, the game alerts the player to the fact that the vaccine is ready to be developed (Figure 4). The game gives multiple hints, mostly through pop-ups, to remind the player that vaccine development can be started. In my view, the game focuses too much on the vaccine, at the cost of other pandemic response actions. Therefore, the argument that the vaccine is the most important pandemic response action, as found in the rules of the game in 4.1.2., is reflected in the instrumental play experience.



Figure 4: Cov vaccine ready to research

Authority: The key to success

The argument found in the rules of the game as described in section 4.1.3. is that maintaining high levels of authority is an important part of saving lives. The play experience reflects this when the game is played instrumentally. Pop-ups explicitly remind the player that they need to do something to ‘avoid the pandemic from damaging your authority’, such as using a certain pandemic response action.

When playing the game instrumentally, I noticed that the game tries to steer the player towards learning about pandemic response actions, while simultaneously making the player pay attention to saving their authority. An equal interplay exists between these two aspects of the game. The question that arises is whether the player also loses when playing the game exploratively. Should the explorative play also lose, then the game is teaching the player a lesson about how difficult it is to overcome a pandemic, no matter how hard the player tries.

4.2.2. Explorative play

After playing the game instrumentally, I played in the explorative play mode. This mode tests a player’s creativity. Players can wander off the paths that the game intends for them. Cues from the game can be ignored and new strategies can be created. I tried to be as creative as I could, for example by applying pandemic response actions from only one tab instead of from all three.⁵³ By playing the game in the explorative mode, I found that ludopedagogical dissonance arose.

The difficulty of dealing with a pandemic: steering by the game

One of the creative ways to play is by not allowing the game to steer you. However, this is difficult to pull off, mostly because the codes and rules of the game do not allow for this

⁵³ Sicart, “Against Procedurality,” 6.

strategy. At the start of the game, the player has to do what the game demands. Otherwise, the player will not be able to play. The player has to investigate outbreaks and has to click on the red bubbles. When the player does not do what the game is steering them towards, the player will not gain any DNA points and consequently be unable to play the game.

The game implicitly and explicitly points the player to the pandemic response actions that are necessary to stop the pandemic. For one, monitoring and quarantining of countries and borders are prompted for when the disease is visibly spreading to multiple countries. When the player decides to ignore these cues, the game punishes them for not implementing the correct pandemic response actions. Following this strategy will cause the player to lose. These examples show how certain pandemic response actions need to be implemented at specific moments and that not all strategies can result in stopping the pandemic. However, this focus on applying the right pandemic response actions at the right time also results in the player focusing too much on creating the right strategy instead of on the pandemic response actions and what they entail.

Vaccination: focus on the vaccine

As described in section 4.2.1. the vaccine plays a crucial role in the game. This is not only reflected in the rules of the game, but also in the visual rhetoric. Another creative way of playing the game is by trying to ignore the vaccine altogether. When the player implements this strategy, a large number of pop-ups will remind them that vaccine research is ready to start. These pop-ups appear more often than when the game is played instrumentally. Even when all the other pandemic response actions have been implemented, the game will still remind the player that vaccine research needs to be started. In addition, the player cannot win by implementing all the other pandemic response actions. This steers the player towards the fact that the vaccine is the best pandemic response action and that they should focus on the creation of the vaccine. This is not what the intention of the creators of the game intended – because their goal was to create awareness of a range of pandemic response actions, not just one. The player knows that introducing the vaccine is the way to win the game. Thus, the excessive focus on the vaccine also results in ludopedagogical dissonance, because the player is focused exclusively on using the vaccine to win the game instead of learning about a range of pandemic response actions.

While the focus is on the vaccine, the game still tries to show the player that the vaccine is not the only important response action to end the pandemic. If the player uses a strategy that is focused mostly on formulating a vaccine, the player loses. This suggests that

the game is attempting to remind the player that they need to implement more pandemic response actions to make a difference in the fight against the pandemic. However, when the player plays only with the pandemic response actions under the ‘Abilities’ tab, which includes the vaccine, the game is won. The vaccine saves the player in the end, even if the authority level is at 1 out of a 100. Therefore, the game convinces the player that the vaccine is the only way to win the game, no matter which other pandemic response actions the player employs. The game contradicts itself, resulting in the wrong lesson being learned. The lesson is that a vaccine is of utmost importance; therefore the player loses focus on the other pandemic response actions.

Authority: winning the game

While ludopedagogical dissonance does arise because of the emphasis on how challenging it is to deal with a pandemic and the focus on the vaccine, its main cause is the issue of authority. In the end, authority is the most important facet in this game, because the player will lose without it. *The Cure* is too focused on the gameplay of its predecessor, which is a strategy game.

An instance in which ludopedagogical dissonance arises is when the player plays only with the pandemic response actions under the ‘Abilities’ tab and still wins the game. The game does not show the player that a variety of pandemic response actions need to be applied to win the game. Instead, the messaging is that a good strategy is all that is needed to win the game. Thus the player focuses on creating strategies, which in turn does not result in learning about how important pandemic response actions are. Ludopedagogical dissonance arises because the game encourages the player to implement different strategies as the one described here.

The ludopedagogical dissonance that arises because of the focus on strategy is reinforced by the way the game ends, whether the player wins or loses. As long as the player maintains their authority level, the player has saved humanity, no matter the number of human lives lost (Figures 5 and 6). This delivers quite a negative message, in the sense that a large number of people will die even when the player has given it their best shot. While delivering a positive message is a good way to convince the public to stick to pandemic response actions, this game seems to do the opposite.⁵⁴ The player is no longer playing to save humanity, they are playing strategically to win the game. This finding affirms Sicart’s critique, which is that

⁵⁴ Henriques, “Social Distancing.”

players, when simply guided by the rules, do not always understand the serious message.⁵⁵ Player behaviour cannot be predicted, as is demonstrated here through the emergence of ludopedagogical dissonance.



Figure 5: You only killed 75.600.000 people



Figure 6: Victory!

4.3. Context: *Plague Inc: The Cure* in relation to the context

In the previous two sections of the analysis, I identified how the game elements created awareness of pandemic response actions and how the play experiences could result in ludopedagogical dissonance. In this third and last section, I will relate these findings to the three selected buildings blocks as defined by Fernández-Vara. These building blocks are: the socio-historical context, the production and the relation to *Plague Inc.*⁵⁶

4.3.1. Socio-historical context: the pandemic

The socio-historical context of *Plague Inc: The Cure* is the COVID-19 pandemic. *The Cure* was created because of the pandemic, and the game will remain free until the pandemic is over. Below I will analyse how the game relates to its real life inspiration.

Epidemiological map

The game refers to its real-life inspiration by reflecting official dashboards implemented by governments around the world (Figures 8 and 9). According to Lorenzo Servitje, this kind of map can also be described as the ‘epidemiological map’. This map has been used in media throughout the years to represent pandemics in spatial dimensions. Information such as the routes of the infection, disease clusters and patient zeros can be found and traced on these maps.⁵⁷ By basing the whole gameplay on the epidemiological map, players are utilising a

⁵⁵ Sicart, “Against Procedurality,” 7-19.

⁵⁶ Fernández-Vara, *Introduction*, 57.

⁵⁷ L. Servitje, “H5N1 for Angry Birds: *Plague Inc.*, Mobile Games, and the Biopolitics of Outbreak Narratives,” *Science Fiction Studies* 43, no. 1 (2016): 86-87.

tool that they recognise from their real-life experience of the pandemic. As in real life, the map in the game is a way to gather and reflect information on the severity of the disease.

The use of the epidemiological map also solves a problem in COVID-19 communication, which is the problem of the invisibility of a pandemic. The challenge with COVID-19 is that its spread is invisible. This invisibility makes the public more sceptical and less likely to abide by the pandemic response actions. That is why including visual imagery, like dots, makes the threat more concrete and visible, which can help to convince people to start socially distancing, for example.⁵⁸ The epidemiological maps used by governments and health organisations already visualise the disease (Figure 8). However, in the game, this is done even better. The game shows exactly where the clusters are by including red dots instead of selecting whole sections of a country (Figure 9). Thus, while the game based its map on real-life epidemiological maps, government and health organisation officials working on the dashboard can learn something from *Plague Inc.: The Cure*.



Figure 8: Epidemiological map produced by European Centre for Disease Prevention and Control



Figure 9: Epidemiological map in *Plague Inc.: The Cure*

Vaccination

The last facet of the game that is closely related to its socio-historical context is the strong focus on vaccination. Currently, many countries are relying heavily on vaccines and discarding the possibility of group immunity. A similar situation applies in the game. The player can only win when the vaccine has been distributed to all countries in the world, which results in ludopedagogical dissonance (section 4.2.2). However, when the game was released, the vaccines that are being distributed at present, for instance the Pfizer and Moderna vaccines, had not been developed yet. That is why this focus on the vaccine as the solution to

⁵⁸ Henriques, "Social Distancing."

all problems is so surprising. In section 4.3.2., the reasons for the game’s strong focus on the vaccine will be provided.

However, the game does also provide a critical take on vaccination by demonstrating how vaccine creation can go awry. For instance, manufacturing can take exceptionally long, which is also the case at present with the many COVID-19 vaccines.⁵⁹ However, the game fails to similarly reflect how long vaccine distribution can take. In the game, once the vaccines are released the pandemic is eradicated in a matter of days. In reality, not everyone wants to be vaccinated and not every country has the means to vaccinate their population. This positive outlook on vaccination portrayed by the game will be elaborated on in section 4.3.2. of this analysis.

4.3.2. Production

Plague Inc: The Cure was created by Ndemic Creations in collaboration with the WHO, CEPI and the Global Outbreak Alert and Response Network (GOARN). Both the WHO and CEPI have released statements on their official websites about the game. My analysis of these statements identified contradictions in relation to the game. I also found indications for the failure of *Plague Inc: The Cure* to deliver on its intended purpose of creating awareness of pandemic response actions.



Figure 10: Ask the experts

⁵⁹ “COVID-19 Vaccines: Development, Evaluation, Approval and Monitoring,” COVID-19, European Medicines Agency, accessed May 4, 2021, <https://www.ema.europa.eu/en/human-regulatory/overview/public-health-threats/coronavirus-disease-covid-19/treatments-vaccines/vaccines-covid-19/covid-19-vaccines-development-evaluation-approval-monitoring>.

CEPI and vaccination

The statement from Ndemc Creations appears to weight the collaborators equally. The company acknowledges all the contributors individually and in no particular order. The game's use of a similar logo to that of the WHO, coupled with the fact that the WHO is the largest international health organisation, suggests that the WHO was the most important collaborator. However, CEPI was in fact the primary collaborator. This information is reflected under the game's 'Information' button. When clicking on this button (Figure 10), the statement names CEPI, but not the WHO. The link in the statement also refers the player to the statement from CEPI.⁶⁰ CEPI is in fact the number-one collaborator, which explains the game's strong focus on the creation and distribution of a vaccine.

CEPI is an innovative global partnership that works to accelerate the development of vaccines. The game reflects CEPI's agenda, by making the vaccine the sole solution to the pandemic and thus the only way to win the game. While the official statement from Ndemc Creations states that the game aims to create awareness of pandemic response actions, the company's close ties with CEPI means that by far the strongest message received by the player is the importance of the vaccine. This emphasis results in a lack of focus on and communication around other pandemic response actions. This imbalance illustrates how important it is for a collaboration between a games company and multiple health organisations to be approached with circumspection.

The WHO and the delivery of information to citizens

In the current infodemic, a great deal of untrue information is shared. In fact, the infodemic could be viewed as a global threat, which the WHO is fighting concurrently with the pandemic.⁶¹ In its lengthy statement on *Plague Inc: The Cure*, the WHO states that it aims to promote actions that can help people detect misinformation.⁶² Given that statement, I wanted to determine whether it was made clear to the player of the game that the information presented in the game needed to be taken seriously. The creators of the game communicate their serious intentions by not only having their collaborator release a statement but also by making the game's 'Authority' logo similar to the WHO logo (Figures 11 and 12). The only

⁶⁰ CEPI, "Plague Inc. The Cure."

⁶¹ Porat et al., "Public Health and Risk Communication," 2.

⁶² "Experts and Gamers join Forces to Fight COVID-19 and Stop Future Disease Outbreaks via *Plague Inc: The Cure*," World Health Organization, last modified March 25, 2021, <https://www.who.int/news-room/feature-stories/detail/experts-and-gamers-join-forces-to-fight-covid-19-and-stop-future-disease-outbreaks-via-plague-inc-the-cure>.

difference is that the game logo does not include the snake. The use of this logo signals to the player that the WHO played a role in the creation of this game.



Figure 11: Authority level



Figure 12: Logo of the WHO

The legitimacy and seriousness of the game is also communicated at the start of the game, when the player clicks on ‘I’ (information) and sees the statement by Ndemie Creations that the game was created in collaboration with health organisations. Pandemic response actions are taken more seriously when medical institutions and specialists are mentioned in the content.⁶³ However, my finding is that besides the logo, the statements and the information found under the ‘I’ button, nothing else reminds the player of the authenticity of the information provided in the game. This is problematic, because players can easily proceed to play the game without taking seriously the information that is imparted. Therefore, in addition to the ludopedagogical dissonance that arises when the game is played exploratively, the player is also not given enough cues and reminders that this game has a serious message to share.

4.3.4. Relation to *Plague Inc.*

Plague Inc: The Cure is based on *Plague Inc*, a successful game that was not created as a serious game. *Plague Inc: The Cure* has retained elements of its predecessor that result in ludopedagogical dissonance, which is problematic. The shared elements are the look and feel of the game and the fact that strategy remains the focus. These similarities indicate that the game was unable to free itself from its entertainment predecessor, undermining its success as a serious game. Future creators of serious games that are based on an entertainment game should be aware of the potential pitfalls.

⁶³ Henriques, “Social Distancing.”

Close relationship between Plague Inc: The Cure and its predecessor

Plague Inc: The Cure is based on *Plague Inc.* which is an entertainment game that focuses on creating an entertaining play experience. While *Plague Inc: The Cure* similarly offers an enjoyable play experience, the game does not follow through on its serious purpose because of its close ties to its predecessor.

The information provided under the tabs ‘Transmission,’ ‘Symptoms’ and ‘Abilities’ still suggests that the player has to kill as many people as possible. The explanation is similar to that of *Plague Inc.* and includes such instructions as: “Increase disease resistance to climate,” and “Spend DNA points to change what your disease gives people!”. These statements create confusion regarding what actions exactly the player should take to stop the pandemic. The similarities to its predecessor result in *Plague Inc: The Cure* being perceived as the same game as its predecessor.

The Cure does differ from its predecessor in some respects. The game needed a new way for players to win, therefore, the ‘Authority’ option was added (Figure 10). However, this option eventually generates a fraught relationship between winning the game and creating awareness of pandemic response actions. Too much emphasis is placed on authority and thus on winning. This leads to players trying to create strategies to win the game, as was the focus of the first game, causing the onset of ludopedagogical dissonance. The creators did not achieve the goal they had in mind when adding ‘Authority’, which was to create awareness of the range of possible responses to COVID-19. Instead, they encouraged even more strategizing.

Catering for fans and avid gamers

While *The Cure*’s gameplay experience is too similar to that of *Plague Inc.*, which generates ludopedagogical dissonance, the game’s target audience is also an issue. Accurately identifying your target audience is an important requirement for the successful communication of COVID-19 information.⁶⁴ In multiple statements, the creators of *Plague Inc: The Cure* indicate that they wish to assist and inform people. Who, then is the game’s intended audience?

While the game is advertised as teaching its players about the challenges that a global health organisation faces when confronting a pandemic, it also falls short in this respect by

⁶⁴ Bechler and Tormala, “Misdirecting Persuasive Efforts,” 188-194.

forcing players to pay for certain tools, such as the creation of their own task force. The game only offers the full experience of being a health organisation when, first, players pay for the game and, second, when players play repeatedly. The game and its potential teachings are therefore less accessible to people who simply intend to play the free game once. These requirements might result in fewer people wanting to play the game, thus reducing the number of people who could potentially have been informed about the pandemic response actions.

5. Conclusion

In this section I will discuss how this research study contributes to game analysis and the debate on serious games by including the concept of ludopedagogical dissonance. The research question is “How does *Plague Inc: The Cure* create awareness of pandemic response actions?” I am able to answer this question because I established a thorough game analysis consisting of text, play experience and context. This conclusion will summarise the answer to the research question and provide suggestions for future research based on the limitations of this research.

5.1. Answering the research question

This study’s first sub-question is “How do the rules in *Plague Inc: The Cure* create awareness on pandemic response actions?” (section 4.1.) By examining them through the lens of procedural rhetoric, I found that the rules of the game were premised on three arguments: First, the rules of the game show how difficult it is to deal with a pandemic, for example by punishing the player for implementing a pandemic action too soon. Second, the vaccine is the most important pandemic response action, because the game rewards the player for implementing vaccine research and makes having the vaccine the only way to win the game. Third, the rules of the game show that maintaining authority is an important factor in saving the world, because they advise the player to focus on both. While these three arguments are inherent to the rules of the game, they are not effectively communicated by the play experience. In section 4.2.2., I discussed the reasons why the player does not ultimately adopt the arguments that underlie the rules.

To answer the second sub-question, “How does the game invite the player to gain awareness on the pandemic response actions when the game is played in an instrumental and explorative game mode?” (section 4.2), I found that the arguments embedded in the rules were not easily adopted by the player. In fact, they resulted in ludopedagogical dissonance. I determined this by playing the game in two modes: instrumental play and explorative play. As expected, I found that when the game is played instrumentally, the arguments embedded in the rules are reflected in the play experience. However, when the game is played exploratively, the play experience does not result in the player gaining awareness of pandemic response actions for three reasons. First, the argument that dealing with a pandemic is difficult leads the player to focus on finding the single best strategy to overcome the pandemic. Second, the argument that the vaccine is the only way to overcome the pandemic and win the game results in the player focusing all their attention on winning the game. Third, the

argument that authority is a crucial aspect of saving the world is causing players to find the best strategy, rather than focusing on the pandemic response actions themselves. The play experience thus generates ludopedagogical dissonance, which is the disconnect between the purpose of the game, the play experience and the knowledge the player gains. This part of the analysis also discusses Sicart's critique of procedural rhetoric.⁶⁵ The player is not just an activator of the game and the unpredictable behaviour of the player can result in ludopedagogical dissonance.

In the third part of the analysis, I answered the following sub-question: "How do the game and its play experience relate to the context?" (4.3.). First, I looked at the socio-historical context, which is the pandemic. I found that the game reflected reality in multiple ways, which allows the game to resonate with players. Second, I analysed the game in relation to its notable production circumstances – the game was produced in collaboration with big health organisations, including the WHO. Examining the production of the game clarifies why ludopedagogical dissonance arises. CEPI, the most important collaborator in the creation of the game, is an organisation that advocates for vaccines. The production also shows that fighting the infodemic with a game is not the best strategy, because it is not clear to the player whether the game is to be taken seriously. Lastly, I analysed the relation between *The Cure* and its predecessor *Plague Inc.* Ndemic Creations made *The Cure* with the original, *Plague Inc.*, in mind. That is why *The Cure*'s play experience is so similar to the original and why it feels and plays like a strategy game. In addition, the target group is the same for both games: that is, gamers who want to invest their time in the game. Reaching a broader audience, beyond the avid gamer group, is therefore a challenge.

Overall, the game succeeds in demonstrating how serious issues such as pandemic response actions can be positioned in an entertaining game environment, which could then attract the gaming audience. However, the creation of awareness of pandemic response actions through this game falls short. Ludopedagogical arises quite easily because, like its predecessor, the game still requires players to focus on strategizing to win the game. Therefore, future endeavours aimed at either creating a serious game or basing a serious game on an entertainment game, should bear in mind that ludopedagogical dissonance is a real issue that should be taken seriously. While dealing with a pandemic is challenging, so is relaying the importance pandemic response actions in a game.

⁶⁵ Sicart, "Against Procedurality," 6.

5.2. Strengths and limitations

In this study, I identified how *Plague Inc: The Cure* created awareness of pandemic response actions and where the game fell short in creating this awareness. However, this research has limitations. First, I analysed only the mobile-phone version of the game. The scope of the study did not allow for the possibility to also analyse the computer version of *Plague Inc: The Cure*. The computer version differs from the mobile version, and may offer an improved integration of the purpose of the game and the play experience. Second, this thesis focuses on only one pandemic-centred game. In response to the ongoing COVID-19 pandemic, a wide range of games focusing on pandemics have been released and these could have been compared.⁶⁶ Third, my game analysis did not use all the building blocks defined by Fernández-Vara. Including all of the building blocks could have resulted in a more thorough understanding of the game and its shortcomings.

Future research could further explore pandemic-centred games from several angles. First, the computer version of *Plague Inc: The Cure* could be analysed. A comparison of the mobile-phone and the computer version could examine whether different mediums might introduce pandemic response actions differently. Furthermore, such a comparison could examine whether ludopedagogical dissonance arose faster in either of the mediums. Second, due to the abundance of games centred on fighting pandemics, future research could analyse the ways in which these games presented a serious message and whether their play experience also resulted in ludopedagogical dissonance. Third, future research on *Plague Inc: The Cure* could include the building blocks that were excluded from this thesis. For instance, by focusing specifically on the economic context of the game, researchers could explore why *Plague Inc: The Cure* included the revenue model (described in 4.3.4.) and examine the model's effects on the creation of awareness.

⁶⁶ B. Adamou, "How games are changing the world. Games and gamification in... a pandemic," *Research World*, last modified June 10, 2020, <https://www.researchworld.com/how-games-are-changing-the-world-games-and-gamification-ina-pandemic/>.

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